WIND ENERGY DEVELOPMENT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

FREQUENTLY ASKED QUESTIONS (FAQs)

What is wind energy?
The terms "wind energy" or "wind power" describe the process by which the wind is used to generate mechanical power or electricity. Wind turbines convert the kinetic energy of the wind into mechanical power. This mechanical power can be used for specific tasks (such as grinding grain or pumping water) or a generator can convert this mechanical power into electricity to power homes, businesses, schools, and the like.

How is the energy in the wind captured?
Wind turbines, like aircraft propeller blades, turn in the moving air and power an electric generator that supplies an electric current. Modern wind turbines fall into two basic groups: the horizontal-axis variety, like the traditional farm windmills used for pumping water, and the vertical-axis design, like the eggbeater-style Darrieus model, named after its French inventor. Most large modern wind turbines are horizontal-axis turbines. Wind turbines are often grouped together into a single wind power plant, also known as a wind farm, and generate bulk electrical power. Electricity from these turbines is fed into the local utility grid and distributed to customers just as it is with conventional power plants.

How big are wind turbines?
Wind turbines are available in a variety of sizes, and therefore power ratings. The largest machine, built in Hawaii, has propellers that span more than the length of a football field, stands 20 building stories high, and produces enough electricity to power 1,400 homes. A small home-sized wind machine has rotors between 8 and 25 feet in diameter, stands upwards of 30 feet, and can supply the power needs of an all-electric home or small business.

What are wind turbines made of?
All electric-generating wind turbines, no matter their size, are comprised of a few basic components: a rotor (the part that actually rotates in the wind), an electrical generator, a speed-control system, and a tower. Some wind machines have fail-safe shutdown systems so that if part of the machine fails, the shutdown systems turn the blades out of the wind or put on brakes.

Are there good wind resources in the United States?
Wind energy is very abundant in many parts of the United States. Wind resources are characterized by wind-power density classes, ranging from class 1 (the lowest) to class 7 (the highest). Good wind resources (e.g., class 3 and above, which have an average annual wind speed of at least 13 miles per hour) are found in many locations (see United States Wind Energy Resource Map). North Dakota, alone, has enough energy from class 4 and higher winds to supply 36% of the electricity of the lower 48 states. Of course, it would be impractical to move electricity everywhere from North Dakota. Wind speed is a critical feature of wind resources, because the energy in wind is proportional to the cube of the wind speed. In other words, a stronger wind means a lot more power.

What are the advantages of wind-generated electricity?
Numerous public opinion surveys have consistently shown that the public prefers wind and other renewable energy forms over conventional sources of generation. Wind energy is a free, renewable resource, so no matter how much is used today, there will still be the same supply in the future. Wind energy is also a source of clean, non-polluting, electricity. Unlike conventional power plants, wind plants emit no air pollutants or greenhouse gases. According to the U.S. Department of Energy, in 1990, California's wind power plants offset the emission of more than 2.5 billion pounds of carbon dioxide and 15 million pounds of other pollutants that would have otherwise been produced. It would take a forest of 90 million to 175 million trees to provide the same air quality.

What are the economic obstacles to greater wind power usage?
Even though the cost of wind power has decreased dramatically in the past 10 years, the technology requires a higher initial investment than fossil-fueled generators. Roughly 80% of the cost is the machinery, with the balance being for site preparation and installation. If wind generating systems are compared with fossil-fueled systems on a "life-cycle" cost basis (counting fuel and operating expenses for the life of the generator), however, wind costs are much more competitive with other generating technologies because there is no fuel to purchase and minimal operating expenses.

Are there environmental problems facing wind power?
Although wind power plants have relatively little impact on the environment compared to other conventional power plants, there is some concern over the noise produced by the rotor blades, aesthetic (visual) impacts, and bird and bat mortality. Most of these problems have been resolved or greatly reduced through technological development or by properly siting wind plants.

Are wind turbines hazardous to birds and bats?
Bird and bat deaths are one of the most controversial biological issues related to wind turbines. The deaths of federally protected birds and bats at wind farm sites have raised concerns by fish and wildlife agencies and conservation groups. On the other hand, several large wind facilities have operated for years with only minor impacts on these animals.

To try to address this issue, the wind industry and government agencies have sponsored research into collisions, relevant bird and bat behavior, mitigation measures, and appropriate study design protocols. In addition, project developers often are required to collect some data through monitoring efforts at existing and proposed wind energy sites. Careful site selection is needed to minimize fatalities and in some cases additional research may be needed to address bird and bat impact issues.

While structures such as smokestacks, lighthouses, tall buildings, and radio and television towers have also been associated with bird and bat kills, bird and bat mortality is a serious concern for the wind industry.

Are wind turbines noisy?
Noise may be a concern to people living near wind projects. However, much of the turbine noise is masked by the sound of the wind itself, and the turbines run only when the wind blows. Noise from wind turbines has diminished as the technology has improved. Early-model turbines are generally noisier than most new and larger models. As blades have become more efficient, more of the wind is converted into rotational torque and less into acoustic noise. Under most conditions, modern turbines are quiet.

Do wind turbines pose a safety hazard?
Unlike most other generation technologies, wind turbines do not use combustion to generate electricity, and hence don't produce air emissions. The only potentially toxic or hazardous materials are relatively small amounts of lubricating oils and hydraulic and insulating fluids. Therefore, contamination of surface or ground water or soils is highly unlikely. The primary health and safety considerations are related to blade movement and the presence of industrial equipment in areas potentially accessible to the public. Depending upon their locations, wind facilities may represent an increased fire hazard. And like all electrical generating facilities, wind generators produce electric and magnetic fields.

Are there other drawbacks to the use of wind energy?
The major challenge to using wind as a source of power is that it is intermittent and does not always blow when electricity is needed. Wind cannot be stored (although wind-generated electricity can be, if batteries are used) and not all winds can be harnessed to meet the timing of electricity demands. Further, good wind sites are often located in remote locations far from areas of electric power demand (such as cities). Finally, wind resource development may compete with other uses for the land, and those alternative uses may be more highly valued than electricity generation. However, wind turbines can be located on land that is also used for grazing or even farming.

Is wind energy good for the economy?
Wind energy avoids the external or societal costs associated with conventional resources, namely, the trade deficit from importing foreign oil and other fuels, the health and environmental costs of pollution, and the cost of depleted resources.

Wind energy is a domestic, reliable resource that provides more jobs per dollar invested than any other energy technology - more than five times that from coal or nuclear power, according to the U.S. Department of Energy. In 1994, wind-turbine and component manufacturers contributed directly to the economies of 44 states, creating thousands of jobs for Americans.

Is the cost of wind power competitive with conventional power plants?
According to the U.S. Department of Energy, new, utility-scale wind projects are being built all around the United States today, with energy costs ranging from 3.9 cents per kilowatt-hour (at very windy sites in Texas) to 5 cents or more (in the Pacific Northwest). These costs are competitive with the direct operating costs of many conventional forms of electricity generation now - and prices are expected to drop even further over the next 10 years. Since wind is an intermittent electricity generator, and does not provide power on an "as needed" basis, it has to compare favorably with the costs saved on fuel from fossil generators.

Where can I learn more about wind energy?
There are many web sites with information on wind power, wind power technology, and wind energy development issues, including environmental concerns. Visit the Wind Energy Links page for a list of web sites with wind energy information.

What is an EIS?
"EIS" is the abbreviation for environmental impact statement, a document prepared to describe the effects of proposed activities on the environment. "Environment," in this case, is defined as the natural and physical environment and the relationship of people with that environment. This means that the "environment" considered in an EIS includes land, water, air, structures, living organisms, environmental values at the site, and social, cultural, and economic factors.

An "impact" is a change or consequence that results from an activity. Impacts can be positive or negative, or both. An EIS describes impacts, as well as ways to "mitigate" impacts. To "mitigate" means to lessen or remove negative impacts.

Therefore, an EIS, is a document that describes the impacts on the environment as a result of a proposed action. It also describes impacts of alternatives, as well as plans to mitigate the impacts.

What is a Programmatic EIS?
A Programmatic EIS evaluates the environmental impacts of broad agency actions such as the setting of national policies or the development of programs. Because BLM's efforts to evaluate additional wind energy development on public lands include the establishment of a national wind energy program and policy, a Programmatic EIS is appropriate.

Why is an EIS needed for wind energy development in the Western states?
The Wind Energy Development Programmatic EIS is needed to maintain compliance with federal laws and regulations that require the federal government to evaluate the effects of its actions on the environment and to consider alternative courses of action. The National Environmental Policy Act of 1969 (NEPA) specifies when an environmental impact statement must be prepared. NEPA requires that an EIS be prepared for major federal actions with the potential for a significant impact on the quality of the human environment. The BLM has determined that the establishment of a national wind energy program and additional related policy would be a major federal action as defined by the NEPA, and, thus, the BLM will prepare an EIS.

What will be covered in the Wind Energy Development Programmatic EIS?
The Programmatic EIS will address the possible amendment of individual land use plans to address future development of wind energy resources on BLM-administered lands. BLM will develop a reasonably foreseeable development scenario to define the magnitude of future wind energy development activities and to identify which land use plans might be amended.

What are land use plans?
Land use plans are planning and management documents that define how resources will be managed within a specific planning area and establish restrictions on activities to be undertaken in that planning area. They are developed by BLM in accordance with applicable regulations and in conjunction with interested stakeholders.

The land use planning process is the key tool used by the BLM to protect resources and designate uses on Federal lands managed by the BLM. These plans help ensure that the public lands are managed in accordance with applicable laws and regulations under the principles of multiple use and sustained yield; recognizing the Nation's need for domestic sources of minerals, food, timber, and fiber while protecting the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water, and archaeological values.

How might land use plans be amended to address wind energy development as a result of this Programmatic EIS?
As a part of the Wind Energy Development Programmatic EIS, BLM will develop a reasonably foreseeable development scenario to define the magnitude of future wind energy development activities on western public lands and to identify which land use plans might be amended. Examples of possible amendments to land use plans include the:

- adoption of stipulations (e.g., wildlife management guidelines) applicable to wind energy development projects, and
- designation of lands for competitive leasing of wind energy resources.

What alternatives and impacts will be addressed in the Wind Energy Development Programmatic EIS?
As currently envisioned, the Programmatic EIS will pay special attention to the resources listed below that involve significant issues associated with wind energy development:

- wildlife and wildlife habitat including avian impacts,
- proximity to military activities,
- visual environment, and
- proximity to wilderness or other special management areas.

The Programmatic EIS will also address the indirect and cumulative impacts associated with wind energy development on a wide range of other resource issues.

The Programmatic EIS will describe:

- wind energy technologies,
- activities undertaken for site monitoring and evaluation,
- activities undertaken for full commercial development, and
- the distribution of wind energy resources on a regional scale.

The Programmatic EIS will also describe the impact associated with current technologies, monitoring, and mitigation measures and constraints relevant to wind energy development. It will include a statement of the purpose and need for the proposed action, including the effect of wind energy development on the nation's energy supply, economy, and energy security.

How long will it take to complete the Wind Energy Development Programmatic EIS?
Preparation of the Wind Energy Development Programmatic EIS is a multi-step process that will be completed in approximately 24 months and will include publication of a draft EIS, a final EIS and a Record of Decision.

Approximate dates for important steps in the programmatic EIS process are as follows:

- Public Scoping Comment Period: Oct. – Dec. 2003
- Draft Programmatic EIS Published: Aug. 2004
- Draft EIS Public Comment Period: Aug. – Nov. 2004
- Final Programmatic EIS Published: Jun. 2005
- Record of Decision Published: To be determined

How can I participate in the Wind Energy Development Programmatic EIS process?
You can attend public scoping meetings for the Wind Energy Development Programmatic EIS, which will be held in several Western states. At the meetings, you can provide information and comments about the scope of the EIS and important issues you think should be addressed in the EIS. There are also other ways for you to provide comments: through the Web (preferred), through the mail, and by fax.